one chance out of ten of being discovered in the routine examination of a one-gram sample. Theoretically, of course, there is a possibility of missing in the microscopic examination of a one-gram sample cases in which as many as nine cysts are present in ten grams. The writer intends to make another survey of 100 ten-gram samples from diaphragms revealing one cyst per gram in the routine microscopic examination, with the intent of determining the distribution of cysts in the muscle around the tendinous portion of the diaphragm. It is known that the larvae are more concentrated around the tendinous part of the diaphragm than elsewhere, but it seems possible, from the data presented above, that the larvae are more or less evenly distributed around the tendons.

In the regular trichinosis survey being conducted at the National Institute of Health, it has been found that approximately 17 per cent of the total number of diaphragms examined contained trichinae. According to the data presented here, probably 5 or 6 per cent of the remaining diaphragms had infestations that were missed in the routine examinations. This adds approximately four or five per cent to the total incidence figure.

ZOOLOGY.—*Notes on the "culture" of aquatic nematodes.*[1] B. G. Chitwood and M. B. Chitwood, Bureau of Plant Industry.

Most aquatic nematodes seem to require considerable aeration and it is not customary to keep such forms alive in the laboratory. To the writer's knowledge, no one has succeeded in keeping marine nematodes reproducing in the laboratory. Eventually, when their feeding habits are sufficiently understood, it seems possible that we may be able to culture aquatic nemas in test tubes. The first steps in this direction are reported in the following experiments wherein such forms have been raised in balanced aquaria.

Aquarium A.—A one quart aquarium bowl, maximum depth 3 inches, was half filled with stream water, to which a little sand, algae and a minute aquatic flowering plant were added. Culture begun October 1937. Water was added to compensate for evaporation. On April 26, 1938, male and egg-laying females of *Tylenchus filiformis* v. *abulbosus* n. var. were secured from the sediment. Gastrotrichs, rotifers and planarians also abounded in this culture. Water, pH 8.3.

Aquarium B.—A rectangular tank 28 by 12 by 10 inches was filled to a depth of 4 inches with sievings from stream, some algae and a small flowering plant (*Lemna* sp.). Kept covered to three-quarters of its length with a

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[1] Received July 29, 1938.

glass plate. Culture begun October 1937. Examined at intervals and fresh tap water added to maintain water-level. *Monhystera similis* with eggs and various developmental stages (at bottom). This species apparently reproduces without males. Another species, *Anaplectus granulosus*, found on the side of aquarium, together with green slime. Other organisms found include turbellaria, gastrotrichs, hydra, a dragon fly nymph (had become almost fully grown during winter). Water, pH 7.8.

Aquarium C.—Similar to B, but equipped with small aerator, an air pump delivering stream of bubbles every few minutes. Original material from another stream (not as in A & B), flowering plant absent; diatoms, copepods and bivalves present. Culture begun October 1937. Examined at intervals and tap water added occasionally. *Monhystera vulgaris* found reproducing in moderate numbers (no males); *Prismatolaimus intermedius* also seen. This aquarium has been neutral to alkaline as evidenced by the appearance of numerous snails during the winter. Water, pH 7.2 to 7.55.

Aquarium D.—Similar to B, but equipped with aerator and without glass top. Ocean sand, sea water and small marine life obtained from beach sand were placed in this aquarium in November 1937. Red and brown algae and sea lettuce were also put in; much of the latter had to be removed to obtain a proper balance. The water level was maintained by adding fresh water (1 pint) daily during winter months. Though a great diversity of species was originally placed in this aquarium, most of them were eliminated. The sea lettuce, red and brown algae, two small crabs, numerous protozoa, copepods and three species of nematodes survived. The latter seem to be doing well, males, egg-laying females and larvae being found. The species are *Metaparoncholaimus heterocytous* n. sp., *Oncholaimium oxyuris* v. *domesticus* n. var., and *Chromadora quadrilinea.* All three forms are apparently phytophagous and oxygen-loving. Algae grew on the aerator, sand became embedded therein and this spot is a veritable nest of oncholaims. Other specimens were found in the bottom sand and on the red alga, but not nearly in the abundance seen on the aerator. It is particularly interesting to note that we have, nematologically speaking, a culture of oncholaims and chromadorids despite the addition, from time to time of varied samples of other nematodes. Water, pH 8.2; total salt 3.35 per cent.

Tylenchus filiformis v. **abulbobus** n. var. Fig. 1A–B

Description.—Stylet devoid of any indication of knobs, prorhabdions, as seen in molting specimen, extremely short; excretory system on right side. Sublateral alae close together; striae exceedingly fine.

Male 630μ long; α, 38; β, 6.5; γ, 5.5. Spicules arcuate, distinctly subdivisible into capitulum calomus and lamina; gubernaculum present.

Female 609 to 709μ long; α, 24 to 27; β, 4.9 to 6.3; γ, 6 to 6.3; vulva 62 to 65%.

Habitat.—Debris at bottom of aquarium; original source, stream.

Locality.—Babylon, N. Y.

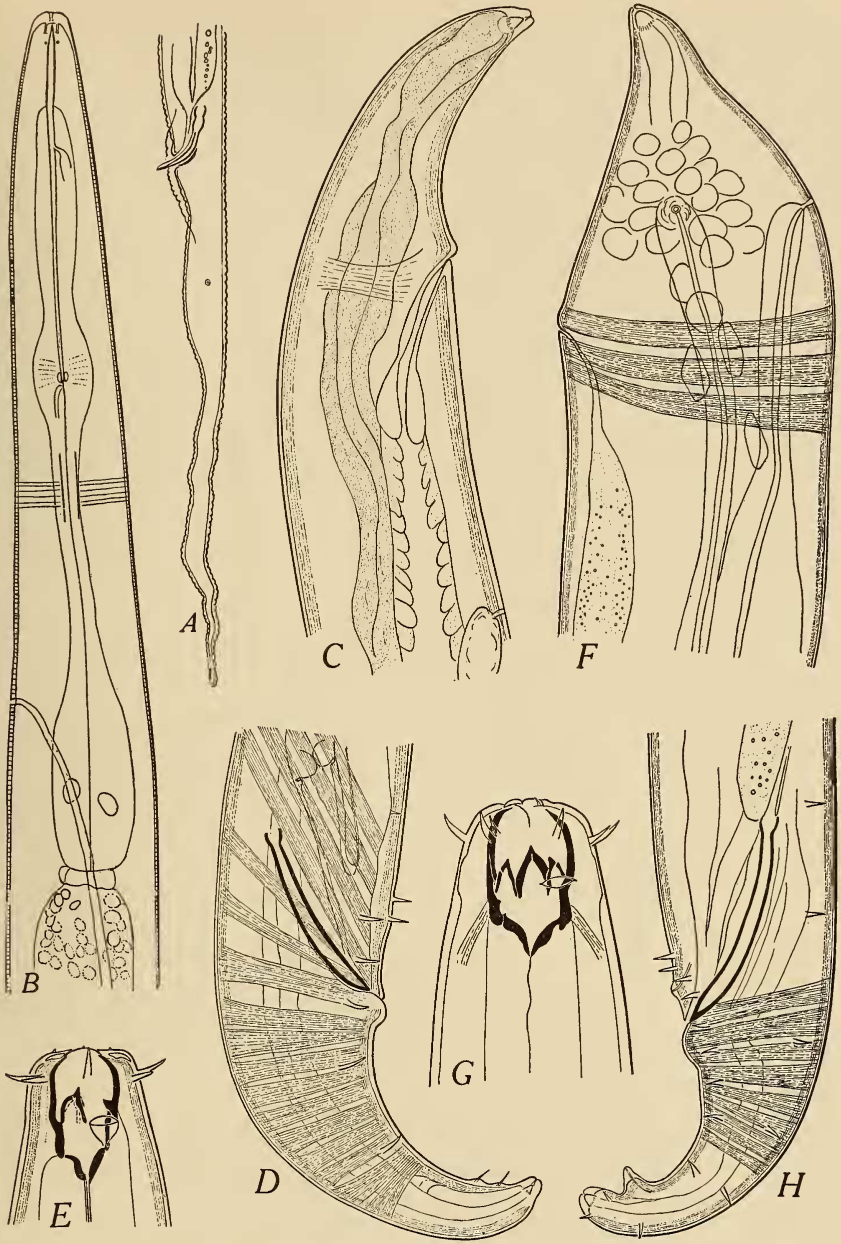

Fig. 1. A–B.—*Tylenchus filiformis* v. *abulbosus* n. var. (A, male tail; B, esophageal region). C–E.—*Metaparoncholaimus heterocytous* n. sp. (C, female tail; D, male tail; E. cephalic region). F–H—*Oncholaimium oxyuris* v. *domesticus* n. var. (F, female tail; G, head; H, male tail).

The species *T. filiformis* (Bütschli, 1873) is described as having weak knobs at the base of the stylet. The present variety is absolutely devoid of such knobs even when the gut is removed from the body. According to recent keys this variety would be transferred to the monotypic genus *Psilenchus* de Man, 1921. However, this hardly seems warranted, nor do we consider the genus *Psilenchus* as valid.

Metaparoncholaimus heterocytous n. sp. Fig. 1C–E

Description.—Subventral teeth subequal, dorsal tooth small. Excretory pore 4 stomatal lengths from anterior end; excretory cell 2.2 esophageal lengths from anterior end.

Male 3.7 to 4.3 mm long; α, 90 to 107, β, 8.6 to 10; γ, 38 to 50. Spicules 1 to $1\frac{1}{2}$ anal body diameters in length, sometimes without apparent cephalation, sometimes cephalated. Without apparent preanal or postanal supplements.

Female 3.7 to 4.9 mm long; α, 65 to 100; β, 9 to 9.5; γ, 55 to 73; vulva 71 to 75%; uterus $\frac{1}{4}$ to $\frac{1}{6}$ length of body, containing up to 6 eggs; tail 1.8 anal body diameters in length. Demanian system opening 2 anal body diameters anterior to anus.

Habitat.—Marine aquarium, among algae in vicinity of aerator; original source, beach.

Locality.—Babylon, N. Y.

Miscellaneous notes.—The intestine contains olivaceous sphaeroids and numerous heterocytes.

The present species differs from *M. campylocercoides* (de Coninck & Stekhoven, 1933) in the absence of a preanal appendage and it differs from *M. campylocercus* (de Man, 1878) in that the tail is cylindrical for $\frac{1}{2}$ its length (compare Fig. 1C), and the vulva is more anterior (at 57 to 60 per cent in *M. campylocercus*).

Oncholaimium oxyuris (Ditl., 1911) v. **domesticus,** n. var. Fig. 1F–H

Description.—Similar to *O. oxyuris* but differing as follows: In *O. oxyuris* the tail is abruptly narrow and cylindroid in its distal half while the female is figured with a row of short eggs in the uterus; in the present form the tail is narrow only in the distal third and the female seems habitually to carry 2 eggs that are 1.5 body diameters long.

Male 4.3 mm long; α, 82; β, 9.3; γ, 50.

Female 3.5 to 4.2 mm; α, 53 to 85; β, 7.0 to 8.5; γ, 53 to 67; vulva 62 to 65%. Excretory pore 3 to 4 stomatal lengths from anterior end; excretory cell $1\frac{2}{3}$ esophageal lengths from anterior end. The demanian system apparently has 2 pairs of exits posterior to the anus.

Habitat.—Marine aquarium, among algae and on aerator; original source, beach.

Locality.—Babylon, N. Y.

Miscellaneous notes.—The intestine of this form contains neutral fats and olivaceous sphaeroids. The latter turn blue in nile blue sulphate, blue in potassium ferricyanide. After alcohol the latter cannot be stained, but numerous small sphaeroids in the chords stain selectively. Birefringents are apparently confined to intestinal contents. The intestinal circumference includes 25 to 40 cells, the cells being rhomboidal to longitudinally diamondform. Heterocytes are few; they contain small colorless sphaeroids and deep orange sphaeroids, the latter being similar in color to the intestinal contents. The faeces of this species contain some living bacteria and rich orange pigment which is quickly diffused in the water. The dead colorless bodies of many flagellates were seen in the faeces while similar, pigmented flagellates lived free in the aquarium. The demanian exit ducts may become colored by this pigment.

Chromadora quadrilinea Filipjev, 1918 Fig, 2A–B

Description.—Alae absent, cuticle punctate with 4 to 6 lateral rows of enlarged punctations. Amphids transversely elongated; 4 long cephalic setae. Stoma with 3 well developed, medially directed teeth. Esophagus terminated by a simple bulb. Intestine 4 to 6 or 8 cells in circumference.

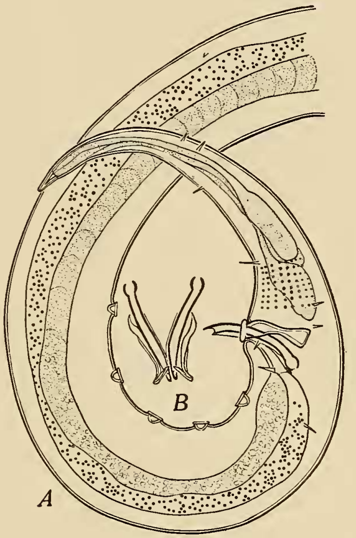

Fig. 2.—*Chromadora quadrilinea* Filipjev, 1918 (A, male tail; B, spicules and gubernaculum).

Male 816 to 840μ long; α, 28 to 35; β, 5.7 to 7.5; γ, 8.8 to 9. Spicules arcuate, indistinctly divisible into capitulum, calomus and lamina; lamina with delicate ala and distally forked. Gubernaculum with weak corpus and well developed crura with square ends. Supplementary organs 5 in number. Filipjev's (1918) original illustration shows no split in the spicule tip but this might be easily overlooked due to the complicated gubernaculum. He also characterized the species as having 6 supplementary organs but Micoletzky (1924) found specimens from the Mediterranean with 5 supplements.

Female 730 to 840μ; α, 22 to 25; β, 6.3; γ, 7.4 to 8; vulva, 47 to 52%.

Habitat.—Marine aquarium, in sea lettuce (*Ulva*) and on aerator.

Locality.—Babylon, N. Y.

Miscellaneous notes.—The intestine contains bright orange sphaeroids soluble in alcohol, birefringent, with negative ninhydrin reaction. Apparently they represent absorbed chlorophyl. The large cell posterior to the excretory cell is apparently a coelomocyte which functions as an athrocyte extracting neutral red or methylene blue from solution; 4 or 5 heterocytes in the posterior third of the intestine behave similarly.

PROCEEDINGS OF THE ACADEMY AND AFFILIATED SOCIETIES

CHEMICAL SOCIETY

501ST MEETING

The 501st meeting was held at the University of Maryland, College Park, Maryland, on Thursday, May 12, 1938, President DRAKE presiding. The meeting was preceded by an informal dinner in the University Dining Hall. After the reading of the minutes the Secretary gave a brief report on the Dallas meeting of the American Chemical Society. Of especial interest to the Society was the adoption by the council of resolutions submitted by the Chemical Society of Washington, and dealing with the indiscriminate sale to the public of possibly dangerous drugs, such as the recently notorious "elixir of sulfanilamide," which caused upwards of seventy deaths. The resolutions as adopted read as follows: "*Resolved,* that the American Chemical Society, the representative body of American chemists, urges the Congress of the United States to set up reasonable and adequate safeguards for the public in all cases of new drugs, substances and mixtures thereof, for use in the diagnosis, cure, mitigation, treatment or prevention of disease in man or other animals."

After the conclusion of the business session, the Society divided into three sections for the reading of papers.

Section of inorganic chemistry, C. E. WHITE presiding.

JOHN KEENAN TAYLOR and EDGAR REYNOLDS SMITH: *Reproducibility of the silver-silver chloride electrode.*—A study was made of the reproducibility of the electrolytic, thermal-electrolytic, and thermal types of the silver-silver chloride electrode in 0.05 N solution of potassium chloride. The presence or absence of light, and of air dissolved in the solution, have no significant effect on their potentials. A marked aging effect was noted, the origin of which was traced to concentration-polarization occurring during the preparation of the electrodes. The attainment of concentration equilibrium between freshly-prepared electrodes and solution is slow and may require from 1 to 20 days, depending on porosity of the electrodes and stirring of the solution. For the same reason, freshly-prepared electrodes behave as cathodes towards aged electrodes, the initial difference in potential often exceeding a millivolt. When sufficient time is allowed for the establishment of concentration equilibrium, these types of silver-silver chloride electrodes assume the same potential, within about 0.02 mv. The significant effect of concentration-polarization and the requirement of sufficient aging time to attain concentration equilibrium within the porous silver chloride, offer a possible explanation for the conflicting data in the literature on this electrode. (*Authors' Abstract.*)

A. L. PITMAN: *Electrochemical production of sodium chlorate.*—This paper has been published in Chem. and Met. Eng. 44, 302 (1937).